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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEFAN KIRSCH, KARL-HEINZ SCHUMACHER, and
ALEXANDER CENTNER

Appeal 2009-010566
Application 10/579,096
Technology Center 1700

Decided: February 18, 2010

Before ADRIENE LEPIANE HANLON, CHUNG K. PAK, and
PETER F. KRATZ, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1 through 9 and 21 through 23, all of the claims pending in the above-identified application. Claims 10 through 20, 24, and 25 were cancelled by the amendment filed along with the third Appeal Brief ("App. Br.") filed October 22, 2008 (See the Advisory Action dated

February 18, 2009 and App. Br. 2). We have jurisdiction under 35 U.S.C. §§ 6 and 134.¹ Oral arguments were presented on January 21, 2010.

We AFFIRM.

STATEMENT OF THE CASE

The subject matter on appeal is directed to:

[A] method of enhancing the performance properties of aqueous polymer dispersions [useful for forming an adhesive film] comprising water-soluble ionic compounds, which comprises removing at least 50 mol% of the water-soluble ionic compounds from the polymer dispersion and then adding at least one salt of a monoalkyl or dialkyl ester of a sulfonated dicarboxylic acid (Spec. 1, ll. 5-19).

The purpose of removing the water-soluble ionic compounds is to avoid an unwanted clouding known as water whitening resulting from the action of water on the adhesive film (Spec. 1, ll. 20-21 and 34-36). Appellants acknowledge that “[m]ethods of removing water-soluble ionic compounds from water are known” (Spec. 7, l. 11). These methods include subjecting an aqueous polymer dispersion to an ion exchange resin, dialysis, or diafiltration to remove water-soluble ionic compounds (Spec. 7, ll. 11-30). The purpose of adding at least one salt of a monoalkyl or dialkyl esters of a sulfonated dicarboxylic acid is to provide good wettability (Spec. 1, ll. 25-36). Details of the appealed subject matter are recited in illustrative claim 1 reproduced from the Claims Appendix to the third Appeal Brief (“App. Br.”) as shown below:

¹ Although Appellants appeal from a non-final rejection, we have jurisdiction pursuant to 35 U.S.C. §§ 6 and 134 since the claims have been twice presented and rejected. *See Ex parte Lemoine*, 46 USPQ2d 1420, 1423 (BPAI 1994).

1. A method of enhancing at least one performance property of an aqueous polymer dispersion comprising at least one water-soluble ionic compound, which comprises

removing at least 50 mol% of the at least one water-soluble ionic compound from the polymer dispersion, and then

adding at least one salt of a monoalkyl or dialkyl ester of a sulfonated dicarboxylic acid.

As evidence of unpatentability of the claimed subject matter, the Examiner relies on the following prior art references at page 3 of the Examiner's Answers ("Ans."), mailed January 21, 2009:

Pastorino	4,940,732	Jul. 10, 1990
Wood	5,286,843	Feb. 15, 1994
Nakabayashi	5,879,663	Mar. 9, 1999
Auchter	2002/0052433 A1	May 2, 2002

Technical Information on Adhesive Raw Materials, Acronal® A 220 (aqueous acrylate copolymer emulsion), by BASF, pp. 1-7 (Jan. 2001) (hereinafter referred to as "BASF").

Appellants request review of the following Examiner's grounds of rejection set forth in the Answer:

- 1) Claims 1 through 9, 21, and 23² under 35 U.S.C. § 103(a) as unpatentable over Wood, as evidenced by Pastorino, in view of BASF;
- 2) Claims 1 through 9, 21, and 23³ under 35 U.S.C. § 103(a) as unpatentable over Wood, as evidenced by Pastorino, in view of Auchter;

² Both the Examiner and Appellants inadvertently refer to the cancelled claims in the statement of this rejection (Ans. 3 and 5 and App. Br. 5 and 8). The cancelled claims are removed from the statement of the rejection.

³ Both the Examiner and Appellants inadvertently refer to the cancelled claims in the statement of this rejection (Ans. 3 and 5 and App. Br. 5 and 8). The cancelled claims are removed from the statement of the rejection.

3) Claim 22 under 35 U.S.C. § 103(a) as unpatentable over Wood, as evidenced by Pastorino, in view of BASF and Nakabayashi; and

4) Claim 22 under 35 U.S.C. § 103(a) as unpatentable over Wood, as evidenced by Pastorino, in view of Auchter and Nakabayashi.

Appellants traverse the Examiner's § 103(a) rejections, arguing that one of ordinary skill in the art would have been led away from adding the claimed wetting agent taught by either BASF or Auchter in Wood's method of removing the water soluble ions in an aqueous latex emulsion used in forming a pressure sensitive adhesive (App. Br. 5-7 and 9 and Reply Br. 1-2). Appellants also argue that the data in Table 1 at page 12 of the Specification evince that the claimed subject matter imparts an unexpected result (App. Br. 7 and 9 and Reply Br. 2-3). Appellants, however, do not dispute the Examiner's obviousness determination of the limitation recited in dependent claim 22 based on an additional reference, Nakabayashi. (Compare Ans. 7-8 with App. Br. 5-9 and Reply Br. 1-3). Appellants rely on the same arguments advanced in connection with claims 1 through 9, 21, and 23 to establish patentability of claim 22 (App. Br. 9).

ISSUES AND CONCLUSIONS OF LAW

The first dispositive question is: Would the collective teachings of Wood (as explained by Pastorino) and either BASF or Auchter have led one of ordinary skill in the art to remove water soluble ions in an aqueous latex emulsion used in forming a pressure sensitive adhesive to improve its water whitening resistance and then add the claimed wetting agent to the same to provide good wettability within the meaning of 35 U.S.C. § 103(a)? On this record, we answer this question in the affirmative.

The second dispositive question is: Have Appellants demonstrated that the claimed invention as a whole imparts an unexpected result, thereby rebutting any prima facie case of obviousness established by the Examiner? On this record, we answer this question in the negative.

FINDINGS OF FACT (“FF”)

1. Appellants do not dispute the Examiner’s finding that Wood, as evidenced by Pastorino, teaches

a process for improving water whitening resistance of a pressure sensitive adhesive containing an aqueous latex emulsion and water soluble ions by removing the water soluble ions. The preferred method of removing the water soluble ions is to contact either the aqueous latex emulsion, the formulated PSA containing the aqueous latex emulsion or both with ion exchange resin (abstract). The removal of water soluble ionic compounds in the dispersion can be accomplished by dialysis, deionization with ion exchange resin to increase the water resistance (column 1, lines 66-68, column 2, line 1). [(Compare Ans. 3 with App. Br. 5-7 and 9 and Reply Br. 1-2; see also Wood, col. 2, ll. 39-68.)]

2. Wood teaches (col. 3, ll. 61-67) (emphasis added) that:

The removal of *water-soluble ions* from the aqueous latex polymer emulsion or pressure sensitive adhesive formulation [containing the same] is critical to the operation of this invention. The water-soluble ions may be removed by a number of techniques, including, but not limited to, centrifugation, dialysis, precipitation and deionization with ion exchange resins.

3. Wood exemplifies using 1 to 2% by weight of ion exchange resins to remove water-soluble ions in the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation containing the same and teaches repeating the same procedure several times, if necessary (col. 4, ll. 18-39).

4. Wood teaches (col. 2, ll. 39-45) (emphasis added) that:

It is an object of the invention to provide a process for improving the water-whitening resistance of pressure sensitive adhesives by removing the water-soluble ions from the latex polymer emulsion *without adversely affecting the pressure sensitive adhesive performance properties*.

6. Appellants also acknowledge (Spec. 1, ll. 16-30) that:

The action of water on the adhesive film leads to an unwanted clouding which is called water whitening. It is known that this clouding is attributable to the presence of water-soluble ionic compounds in the adhesive film.

Although the resulting polymer dispersions then have an improved water whitening behavior,...their [certain] performance properties are impaired. In particular they have poor wettability on customary substrates such as polymer films or silicone papers, and on these substrates can hardly still be uniformly applied and filmed.

7. Appellants do not dispute the Examiner's finding that the poor pressure sensitive adhesive wetting performance property would have been readily recognized by one of ordinary skill in the art. (Compare Ans. 9 with App. Br. 5-9 and Reply Br. 1-3).

8. Auchter teaches employing about 0.1 to 10, preferably 0.2 to 3, parts by weight of a solution containing a salt of monoalkyl or dialkyl ester of a sulfonated dicarboxylic acid as a wetting agent per 100 parts by weight of an aqueous polymer dispersion used for adhesives on a wide variety of substrates to provide good substrate wetting and a largely flawless substrate surface (p. 1, paras. 0001-0003 and 0027).

9. Auchter teaches that other known wetting agents, including the derivatives of sulfonated succinic acid, cause severe foaming and prevent the development of flawless surfaces (p. 1, para. 0005).

10. Appellants do not dispute the Examiner's finding that BASF teaches using 0.5 to 1.5% of sodium salt of dioctyl sulfosuccinate corresponding to the claimed wetting agent for Aronal® A 220, an aqueous acrylate copolymer emulsion used for pressure sensitive adhesives. (Compare Ans. 4 with App. Br. 5-7 and 9 and Reply Br. 1-2; see also BASF, pp. 1-3.)

11. Table 1 at page 12 of the Specification shows that Acronal A 200, Acronal DS 3556, and Acronal DS 3559 subjected to diafiltration have no water whitening effect even after 60 minutes, Acronal A 200 and Acronal DS 3556 subjected to diafiltration and addition of 1% of Lumiten I-SC (diethylhexyl ester of sulfonated succinic acid) have a little whitening effect after 60 minutes, and Acronal DS 3559 subjected to diafiltration and addition of 1% of Lumiten I-SC has no whitening effect after 60 minutes.

12. Table 1 shows the above three particular polymer dispersions having *unknown amounts* of water-soluble ions subjected to diafiltration for the removal of *unknown amounts* of water-soluble ions to impart water-whitening resistance for at least sixty minutes. (Spec. 10-12).

13. Table 1 shows that the addition of 1% of Lumiten I-SC (diethylhexyl ester of sulfonated succinic acid) to polymer dispersions caused a *slight decrease to no decrease* in water-whitening resistance at 60 minutes with a concurrent improvement in wettability (Spec. 11, ll. 17-21 and Spec. 12, Table 1).

14. It can reasonably be inferred from Table 1 that the presence of 1% of Lumiten I-SC in the above polymer dispersions would cause a greater water whitening effect after 60 minutes since Table 1 shows the increased water-whitening effect with the increased time.

15. As correctly found by the Examiner at pages 4, 9, and 11 of the Answer, one of ordinary skill in the art would have reasonably expected the slight decrease in the improvement of water-whitening resistance with a concurrent improvement in wettability performance in Table 1 via adding the minute amount of the wetting agent taught by BASF or Auchter to the polymer dispersion or adhesive formulation treated in the manner taught by Wood, as explained by Pastorino (Wood, col. 2, ll. 39-68 and Auchter, p. 1, paras. 0001-0003 and 0027).

16. While Table 1 at page 12 of the Specification is directed to only three specific polymer dispersions with a specific amount of one specific wetting agent, the claims on appeal are not so limited.

17. Appellants have not shown that the same result can be obtained using the polymer dispersions, water-soluble ionic compounds, and wetting agents covered by the claims, but materially different from those exemplified at Table 1 in the Specification and employing *more than 1%* of the specific wetting agent covered by the claims, but not exemplified at Table 1 in the Specification.

PRINCIPLES OF LAW AND ANALYSIS

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations, if any. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966).

As stated in *KSR Int'l. Co., v. Teleflex Inc.*, 550 U.S. 398, 418 (2007):

[A]nalysis [of whether the subject matter of a claim would have been *prima facie* obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Here, Wood teaches (col. 2, ll. 39-45) (emphasis added) that:

It is an object of the invention to provide a process for improving the water-whitening resistance of pressure sensitive adhesives by removing the water-soluble ions from the latex polymer emulsion *without adversely affecting the pressure sensitive adhesive performance properties*.

Wood also teaches (col. 3, ll. 61-67) (emphasis added) that:

The removal of *water-soluble ions* from the aqueous latex polymer emulsion or pressure sensitive adhesive formulation [containing the same] is critical to the operation of this invention. The water-soluble ions may be removed by a number of techniques, including, but not limited to, centrifugation, dialysis, precipitation and deionization with ion exchange resins.

Wood exemplifies using 1 to 2% by weight of ion exchange resins to remove water-soluble ions in the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation containing the same and teaches repeating the same procedure several times, *if necessary*. Appellants do not argue that Wood would not have suggested removing at least 50% of the water-soluble ions in the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation containing the same. *See also In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) (“[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.”). Wood does not mention adding at least one salt of a monoalkyl or dialkyl ester of a sulfonated dicarboxylic acid (a known wetting agent) after removing water-soluble ions from the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation containing the same as required by claim 1.

However, Auchter teaches employing about 0.1 to 10, preferably 0.2 to 3, parts by weight of a solution containing a salt of monoalkyl or dialkyl ester of a sulfonated dicarboxylic acid as a wetting agent for 100 parts by weight of aqueous polymer dispersion used for adhesives on a wide variety of substrates to provide good substrate wetting and largely flawless substrate

surfaces. Appellants also do not dispute the Examiner's finding that BASF teaches using 0.5 to 1.5% of sodium salt of dioctyl sulfosuccinate for Aronal® A 220 corresponding to the claimed wetting agent for Aronal® A 220, an aqueous acrylate copolymer emulsion used for pressure sensitive adhesives. According to Auchter, other known wetting agents, including the derivatives of sulfonated succinic acid, can cause severe foaming and prevent the development of flawless surfaces.

Given these teachings, we concur with the Examiner that one of ordinary skill in the art would have been led to add a minute amount of at least one salt of a monoalkyl or dialkyl ester of a sulfonated dicarboxylic acid taught by Auchter or BASF as a wetting agent after removing a sufficient amount of water-soluble ions from the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation containing the same, with a reasonable expectation of successfully providing good wettability performance and good water-whitening resistance. *KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S. at 417 (quoting *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976)) (“[W]hen a patent ‘simply arranges old elements with each performing the same function it had been known to perform’ and yields no more than one would expect from such an arrangement, the combination is obvious.”).

This is especially compelling in this case since Appellants do not dispute the Examiner's finding at page 9 of the Answer that the poor pressure sensitive adhesive wetting performance property would have been readily recognized by one of ordinary skill in the art. *See also In re Ludwig*, 353 F.2d 241, 244 (CCPA 1965) (Discovery of a problem readily noticeable

by one of ordinary skill in the art does not impart patentability). This recognition would have further apprised one of ordinary skill in the art of the need to include the minute amount of the water-soluble wetting agent taught by Auchter or BASF to provide necessary wetting performance and flawless surfaces, with or without a concurrent minor or slight decrease in the improvement of water whitening resistance.

Contrary to Appellants' contentions at pages 5 through 9 of the Appeal Brief and pages 1 and 2 of the Reply Brief, nowhere does Wood discourage the use of a minute amount of at least one salt of a monoalkyl or dialkyl ester of a sulfonated dicarboxylic acid, a water-soluble ionic compound. Wood teaches removing water soluble ionic compounds in the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation containing the same to the extent that such removal does not adversely affect the pressure sensitive adhesive performance properties, inclusive of the pressure sensitive adhesive wetting performance property discussed *supra*. Moreover, Wood, by virtue of teaching the importance of repeating a water-soluble ion removal step as necessary, indicates that its water-soluble ion removal step is used to remove water-soluble ions in an amount sufficient (not necessarily the entire amount) to impart desired water-whitening resistance to the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation containing the same.

Even if Wood is read as requiring the total absence of any water-soluble ionic compounds in the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation containing the same, the outcome would not be changed. As correctly found by the Examiner at pages 4 and

10 of the Answer, one of ordinary skill in the art, recognizing the problem associated with the wettability performance of the aqueous latex polymer emulsion or the pressure sensitive adhesive formulation resulting from Wood (as explained by Pastorino), would have been led to add the minute amount of the wetting agent taught by BASF or Auchter with a reasonable expectation of successfully obtaining good wettability performance with a concurrent slight decrease in the improvement of water-whitening resistance.

Appellants rely on the data in Table 1 at page 12 of the Specification to show that the claimed invention imparts an unexpected result. Table 1 shows three particular polymer dispersions having *unknown amounts* of water-soluble ions subjected to diafiltration for the removal of *unknown amounts* of water-soluble ions to impart water-whitening resistance for at least sixty minutes. Table 1 also shows that the addition of 1% of Lumiten I-SC (diethylhexyl ester of sulfonated succinic acid) to these polymer dispersions caused *a slight decrease to no decrease* in water-whitening resistance at 60 minutes with a concurrent improvement in wettability performance. Further, it can reasonably be inferred from Table 1 that the presence of 1% of Lumiten I-SC in these polymer dispersions would cause a greater water whitening effect after 60 minutes since Table 1 shows the increased water-whitening effect with the increased time.

Appellants bear the burden of showing that the claimed invention imparts an unexpected result. *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972). However, Appellants have not demonstrated that the data in Table 1 are sufficient to demonstrate that the claimed invention imparts an unexpected result as asserted by the Examiner at pages 9 through 11 of the Answer. In particular, Appellants have not shown that the data in Table 1

are significant and unexpected by one of ordinary skill in the art. *In re Skoner*, 517 F.2d 947, 949 (CCPA 1975) (Expected beneficial results are evidence of obviousness just as unexpected results are evidence of unobviousness); *In re D'Ancicco*, 439 F.2d 1244, 1248 (CCPA 1973) (Appellants has the burden of showing the significance of the asserted improvement). As correctly found by the Examiner at pages 4, 9 and 11 of the Answer, one of ordinary skill in the art would have reasonably expected the slight decrease in the improvement of water-whitening resistance with a concurrent improvement in wettability performance shown in Table 1 from adding the minute amount of the wetting agent taught by BASF or Auchter to the polymer dispersion or adhesive formulation treated in the manner taught by Wood, as evidenced by Pastorino. We also note that Appellants have not demonstrated, much less explained, why the showing in Table 1 is reasonably commensurate in scope with the degree of protection sought by the claims on appeal. *In re Grasselli*, 713 F.2d 731,743 (Fed. Cir. 1983); *In re Clemens*, 622 F.2d 1029, 1035 (CCPA 1980).

Accordingly, based on the totality of record, including due consideration of Appellants' arguments, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the meaning of 35 U.S.C. § 103(a).

ORDER

In view of the foregoing, the decision of the Examiner rejecting the claims on appeal is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314